

TWO NEW SPECIES OF *XYRIS* FROM CUBAARMANDO URQUIOLA CRUZ¹ROBERT KRAL²

Research Associate, Section of Botany

ABSTRACT

Two new species of *Xyris* (Xyridaceae) are described and illustrated, both endemic to western Pinar del Río Province, Cuba. Differences between these and two closely related species, *X. navicularis* Griseb. and *X. bicarinata* Griseb., are discussed. A key to the four species is included.

RESUMEN

Se describen e ilustran dos especies nuevas de *Xyris* (Xyridaceae) endémicas del occidente de Pinar del Río Provincia, Cuba. Se discuten las diferencias entre éstas y la cercana *X. navicularis*, *X. bicarinata*, además se dan las claves para las mismas.

INTRODUCTION

During an examination of material of Xyridaceae for the Flora of the Greater Antilles, the senior author had difficulty with some morphologic extremes of what previously had been identified as *Xyris navicularis*, particularly with samples gotten by him and others from far western Pinar del Río Province. Further fieldwork by him in western Pinar del Río has served not only to confirm extreme variation, but also to find populations of two related and yet distinctly different species. These two novelties, now sufficiently vouchered, are described, figured, and discussed below. Since there are also some character states in this complex of species that are shared by yet another Cuban endemic, *X. bicarinata* Griseb., we include and compare that species also.

Institutional abbreviations in text follow Holmgren et al., 1990.

DESCRIPTION OF NEW SPECIES

Xyris bissei Urquiola & Kral, **species novum**

(Fig. 1)

Herba perennis, densicaespitosa; radices fibrosa. **Caules** breves. **Folia** principalia anguste linearia, 8–15 cm longa, erecta vel anguste flabellate expansa, vaginis scaporum longiora. **Laminae** foliorum compressae, tortae, 2–3 mm latae, vaginis 3–4-plo longiores, longitudine subtiliter multinervosae, brunneolo-ferrugineae vel testaceae; apices gradatim, tum abrupte incurvato-acuti, leviter incrassati; margines cartilagineo-incrassati, grosse papilloso vel scabrelli; vaginae integrae, carinatae, carinibus ad apicem leviter papilloso, lateribus valde longitudinae multicostatae, basi brunneae, glabrae, valde pluricostatae, marginibus in laminas gradatim convergentibus, ad apicem ligulam erectam vel excurvatam acutam 1.5–

¹ Departamento de Biología, Instituto Superior Pedagógico de Pinar del Río, Cuba.

² Department of Biology, Vanderbilt University, Nashville, Tennessee.

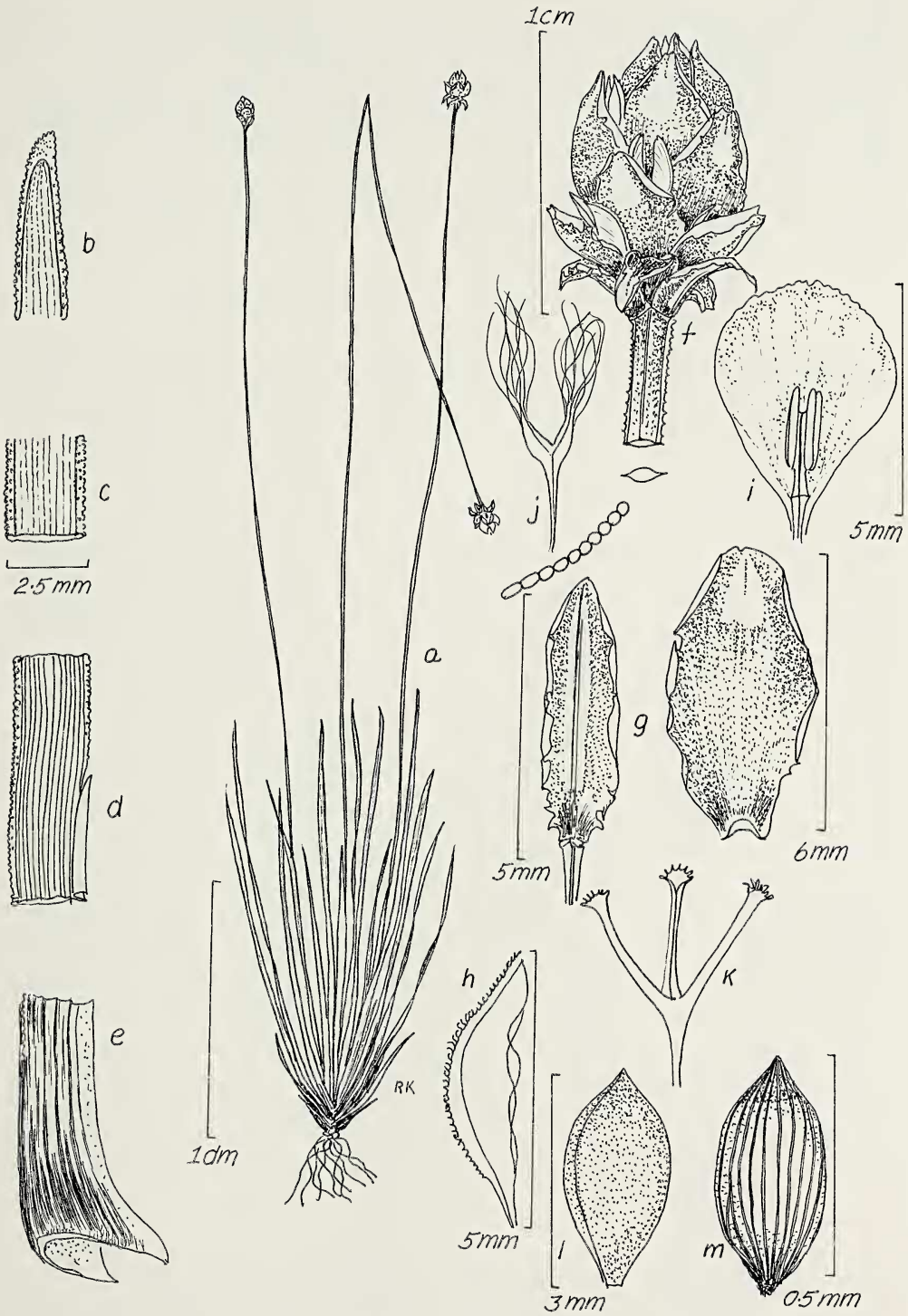
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2 mm longam fascientes, infime gradatim dilatatae. **Vaginae scaporum** laxae, valde convolutae sed apertae, laminis brevibus. **Scapi** erecti, subfiliformes, torti et flexuosi, vulgo bicostati, distaliter parum compressi aut ovales, 0.7–1 mm lati, costis duas angustata scabropapillatas fascientes. **Spicae** obovoideae, late ovoideae ubi maturae, 8–13 mm longae, pluriflorae, breviter attenuatae; bracteae laxe spiraleriter imbricatae, tenues, pallide brunneolae, margine late scariosae, involuto-laceratescens; bracteae steriles ca. 4, mox valde excurvatae vel recurvatae, oblongo-ellipticae vel anguste ovatae, 5–5.5 (–6) mm, areis dorsalibus linearibus bracteam aequantibus, viridis, unicostalis; bracteae fertiles late ovatae aut ellipticae, 5.5–6.5 mm longae, ecarinatae, leviter convexae, ad apicem obtusae et areis dorsalibus brevibus, ovatis, indistinctis, dilutis, ad apicem leviter carinatis. **Sepala lateralia** libera, subequilateralia, valde curvata, elliptica, ca. 5 mm longa, acuta, ala carinali firma, prominente crispato-ciliolata. **Laminae petalorum** late rhombeo-orbiculatae, luteolae, margine denticulatae. **Staminodia** bibrachiata, brachiis longipenicillata. **Antherae** oblongae, ca. 2 mm longae, profunde bifidae et auriculatae; filii brevis, 0.5–0.6 mm longis. **Capsula** ellipsoideae vel anguste obovoideae, 3 mm longae, apiculatae, pallide cinereo-brunneolae; placenta marginalis. **Semina** numerosa, ellipsoidea, 0.5 mm longa, pallide brunneola, translucida, longitudine valde multicostata.

Slender but stiff and densely cespitose, hard-based perennial 20–60 cm high. Roots coarse, fibrous. Stems short. Principal foliage leaves ascending or in narrow fans, longer than the scape sheaths, 8–15 cm long; blades linear, flat, 2–3 mm wide, narrowed gradually to an incurved-acute, slightly thickened tip, the edges cartilaginous-thickened, scabridulous-papillate, the surface smooth, finely nerved, greenish-brown; sheaths entire, keeled, $\frac{1}{3}$ – $\frac{1}{4}$ as long as blades, with edges forming an erect or slightly excurved scarious ligule 1.5–2 mm long at narrowed base of blade, and gradually dilating downward, the base smooth, deep brown, strongly few-costate, the keel costa papillate-scabridulous. Scape sheaths loosely tubular, strongly convolute but open, short-bladed. Scapes wiry, twisted and flexuous, mostly two-costate, distally slightly compressed or oval, 0.7–1 mm wide, the costae forming two strong, scabro-papillate edges. Spikes ovoid, maturing broadly ovoid, 8–13 mm long, of several spirally and loosely imbricate, thin, light-brown bracts; sterile bracts mostly four, elliptic to narrowly ovate, 5–5.5 (–6) mm long, broadly acute, soon strongly excurved or recurved, lacerate, with pale or pale green, narrowly elliptic, elongate dorsal areas, carinate; fertile bracts broadly ovate or elliptic, 5.5–6.5 mm long, ecarinate, slightly convex with indistinct, ovate, paler, apically low-carinate dorsal areas, the apex obtuse or slightly emarginate, the thin borders strongly involute, becoming strongly lacerate. Lateral sepals free, subequilateral, strongly curvate, elliptic, ca. 5 mm long, acute, the firm but broad keel prominently crisped-ciliate. Petal blades rhombic-orbicular, 5 mm long, yellow, low-toothed. Staminodia bibrachiata, the branches long-penicillate. Anthers oblong, ca. 2 mm long, deeply bifid and auriculate, on short filaments 0.5–0.6 mm long. Capsule ellipsoid or narrowly obovoid, 3 mm long, apiculate, pale gray-

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Fig. 1.—*Xyris bissei* (Urquiola et al. 7876). a. Habit sketch; b. leaf tip; c. leaf midblade; d. leaf blade-sheath junction; e. leaf base; f. spike; g. lowest spike bract (left), -fertile bract (right); h. lateral sepal; i. petal blade and stamen; j. staminode and enlarged apical sector of beard hair (below); k. stylar apex; l. capsule; m. seed.



brown, the placentation parietal. Seeds ellipsoid, 0.5 mm long, pale amber, translucent, with ca. ten strong, horizontal, parallel ribs per side.

Type.—CUBA. **Pinar del Río**: Pinares sobre arenas blancas, próximo a la Laguna de Los Carneros, Santa Teresa, Guane, m.s.m. 5, 12 Apr. 1993, A. Urquiola, A. Urquiola f., E. Lezcano, R. Novo 7876 (holotype: HPPR; isotypes: GH, HAJB, HAC, NY, VDB).

Etymology.—This species is named in honor of the late Johannes Bisse, an exceptional worker on the Cuban flora and teacher of many present-day Cuban botanists.

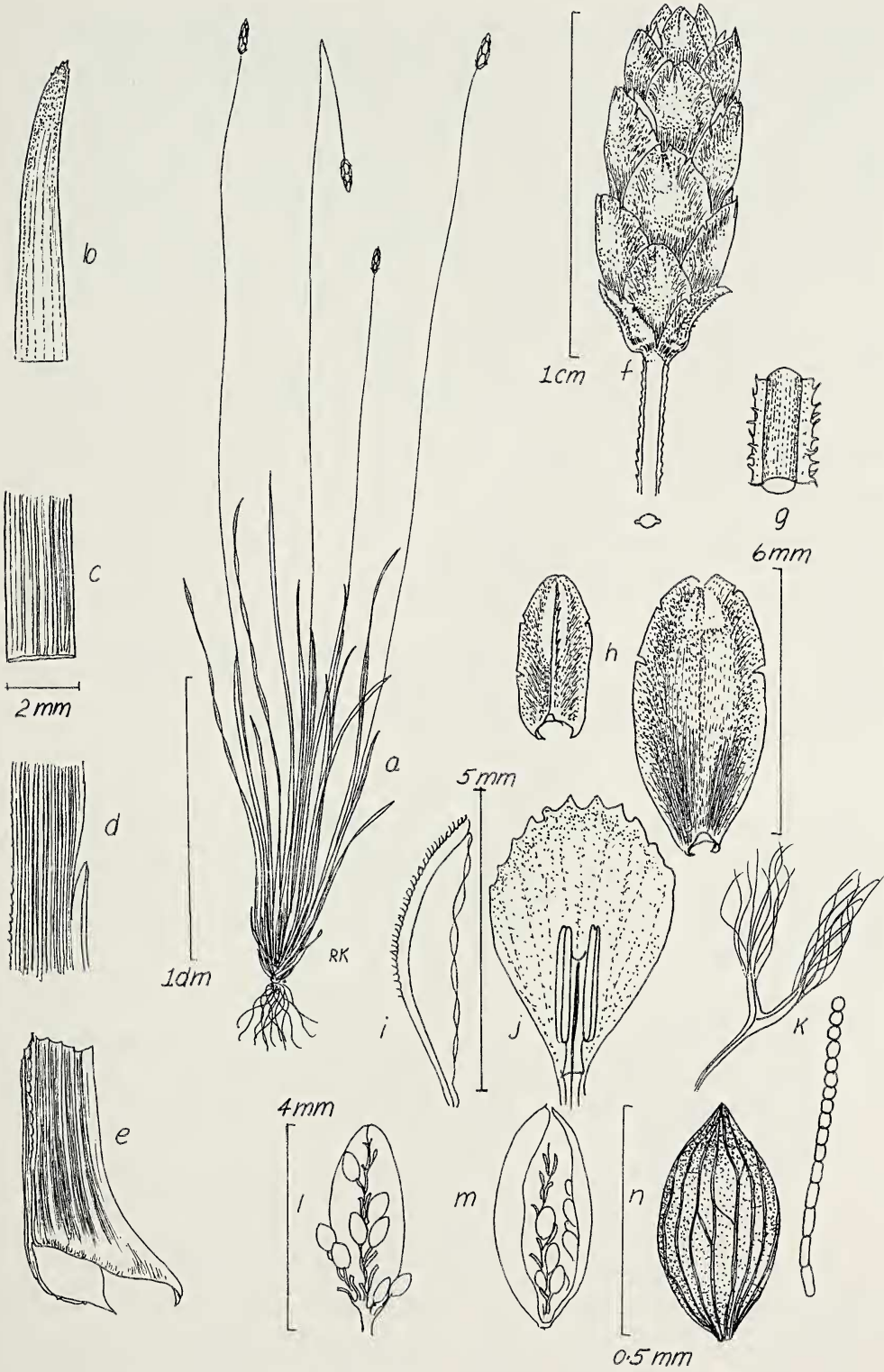
Xyris mantuensis Urquiola & Kral, **species novum**
(Fig. 2)

Herba perennis, gracilis, densicaespitosa; radices fibrosa. **Caules** breves. **Folia principalia** anguste linearia, 15–20 (–25) cm longa, erecta vel anguste flabellate expansa, vaginis scaporum longiora. **Laminae foliorum** compressae, tortae vel rectae, 1–2 (–3) mm latae, vaginis 4–5-plo longiores, integrae, longitudine subtiliter multinervosae, olivaceae; apices gradatim decrescentes, anguste acuti, vulgo prominente scabro-papillatae; margines tenues, a basin dorsaliter papilloso vel ciliatae; vaginae integrae, carinatae, carinibus ad apicem leviter scabridis, lateribus valde longitudine multicostatae, basi atroferrugineae aut brunneolae, nitidae, marginibus in laminas gradatim convergentibus, ad apicem ligulam erectam vel excurvatam acutam 1.5–2 mm longam fascientes, infime gradatim, tum abrupte dilatatae. **Vaginae scaporum** laxae, conduplicatae, a medio ad apicem apertae, laminis breves. **Scapi** erecti, subfiliformes, torti et flexuosi, a basin teres, multicostali, apicem versus vulgo bicostati, ca. 1 mm lati, plerumque costis duas alas valde papillosas aut ciliatas fascientes. **Spicae** anguste ellipsoideo-cylindricae vel lanceoloideae, 1.2–1.6 cm longae, pluriflorae; bracteae steriles mox 4, pari infimo oblongo, valde carinato, carinis scabridis, obtuso, 3–3.5 mm longo, paribus intimis fertilibus leviter breviores, in fertiles gradatim transientes; bracteae fertiles obovatae vel late ellipticae, 5.5–6 mm longae, integrae tum laceratae, convexae, areis dorsalibus late ovatis, brevis, indistinctis, subapice carinatis. **Sepala lateralialia** libera, subequilateralialia, valde aut leviter curvata, 3.5–5 mm longa, acuta; ala carinali a medio ad apicem ciliolata. **Laminae petalorum** obovatae, ca. 5 mm longae, late rotundatae, serratae. **Staminodia** bibrachiata, brachiis longipenicillatis. **Antherae** oblongae, ca. 2 mm longae, profunde retusae et auriculatae; fila lata, ca. 7 mm longa. **Capsula** ellipsoidea, 4 mm longa, placentatio parietalis. **Semina** ellipsoidea, apiculata, 0.5 mm longa, translucida, longitudine valde multicostata.

Herb perennial, slender, densely cespitose, hard-based, 30–45 cm high. Roots coarsely fibrous. Stems short. Principal foliage leaves ascending in narrow fans, 15–20 (–25) cm long; blades flattened, twisted or straight, narrowly linear, 1–2.5 (–3) mm wide, tapering gradually to slightly thickened, incurved, narrowly acute tip, the margin slightly if at all thickened, papillate to ciliate at least toward base,

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Fig. 2.—*Xyris mantuensis* (Urquiola et al. 7880). a. Habit sketch; b. leaf apex; c. leaf midblade; d. leaf blade-sheath junction; e. leaf base; f. spike; g. extreme example of midscape costa; h. lower spike bract (left), -fertile bract (right); i. lateral sepal; j. petal blade, stamen; k. staminode and enlarged apical sector of beard hair (below right); l. capsule valve, adaxial side; m. capsule, valves pulled apart; n. seed.



surface smooth, greenish-maroon with several low nerves, blade base narrowed at junction with sheath; sheaths entire, multicostate, keeled distally, keel costa strongly scabro-ciliate, at blade junction producing an erect to excurved ligule 1.5–2 mm, gradually, then abruptly dilating downsheath to a broad base, distally pale yellow-green, proximally deep red-brown or brownish, lustrous. Scape sheath conduplicate but loose, open most of its length, and with a short, linear blade similar to foliage leaf. Scapes subfiliform, twisted and flexuous, proximally terete, several-costate, costae narrow but strong, distally with fewer, often two, costae, ca. 1 mm wide, the strong costae forming edges, these commonly intermittently papillate to strongly tuberculate-scabrid, or retrorsely so. Spikes narrowly ellipsoid-cylindric or lanceoloid, 1.2–1.6 cm long, of many subdecussately arranged, loosely imbricate, ascending, tan to brown bracts with indistinct dorsal areas; sterile bracts usually four, the lower pair oblong, 3–3.5 mm long, blunt, carinate, the keel raised and scabrid, the upper pair slightly longer, broader; fertile bracts broadly elliptic or narrowly obovate, convex, 5.5–6 mm long, entire aging lacerate, the paler dorsal area with a low carina subapically. Lateral sepals free, subequilateral, strongly or slightly curved, 3.5–5 mm long, the broadly rounded apex coarsely toothed. Petal blades obovate, ca. 5 mm long, broadly rounded, serrate. Staminodia bibrachiate, branches long-penicillate-hairy. Anthers oblong, ca. 2 mm long, deeply bifid and auriculate, the connective broad, on short flattened filaments ca. 0.7 mm long. Capsule ellipsoid, 4 mm long, placentation three-parietal. Seeds broadly ellipsoid, 0.5 mm long, amber, with ca. ten strong, mostly parallel ribs per side.

Type.—CUBA. **Pinar del Río**: Pinares sobre arenas blancas de Playa La Cana, Mantua, m.s.m. 5, 1 Jan. 1994, A. *Urquiola* & A. *Urquiola* f. 7880 (holotype HPPR; isotypes GH, HAC, HAJB, NY, VDB).

Etymology.—This species is named for the type locality.

DISCUSSION

There are two other species of *Xyris* in the Antilles with which the two new species could be confused and which can co-occur with them in the white sand savanna or pineland ecosystems of Pinar del Río, namely *X. navicularis* Grisebach (as mentioned), the nearest morphologically to *X. mantuensis*, and *X. bicarinata* Grisebach, which resembles *X. bissei* in spike and somewhat in leaf. These four species are compared by means of the following key:

- 1a. Mature (seeding) spikes broadly ovoid or obovoid, with at least the lower bracts strongly excurved or recurved.
 - 2a. Leaf blades narrowly linear or filiform, 1–2 mm wide, the edges thickened, often with a median furrow, smooth or nearly so, and not in color contrast with the rest of the blade, medially with 1–3 strongly raised nerves, the others lower or indistinct *X. bicarinata*
 - 2b. Leaf blades linear, 2–5 mm wide, the edges a narrow or strong, cartilaginous, smooth to papillate band in pale contrast with the rest of the blade, the faces with more and less strongly raised nerves.
 - 3a. Bracts aging lacerate and also strongly revolute-inrolled; blades of principal leaves mostly 2–3 mm wide, their margins moderately to strongly papillate or rugulose-papillate; scape costae mostly papillate or scabridulous. *X. bissei*
 - 3b. Bracts aging lacerate but scarcely if at all revolute; blades of principal leaves 2–5 mm wide, their margins mostly smooth, rarely sparsely papillate; scape costae smooth to sparsely papillate *X. navicularis*
- 1b. Mature (seeding) spikes narrowly ovoid to lanceoloid or ellipsoid-cylindric, the bracts (spreading-) ascending to erect.
 - 4a. Spikes lance-cylindric, narrowly ellipsoid, or cylindric, 0.4–0.7 cm thick, mostly widest

at or near middle; leaf sheath apex with ligule 1–1.5 mm long; margins of leaf blades remotely papillate to papillate or even scabrociliate; the most prominent scape costae papillate to intermittently scabrociliate, often retrorsely so *X. mantuensis*

4b. Spikes ovoid to lance-ovoid or broadly cylindric, 0.7–1.0 cm thick; leaf sheath apex with ligule 0.2–0.5 mm long or ligule lacking; margins of leaf blades smooth, rarely sparsely papillate; scape costae smooth or sparsely or distantly papillate. *X. navicularis*

Of the four species treated in the key above, only *X. navicularis* is found outside Cuba, appearing in savanna or pine savanna in Belize, Honduras, Nicaragua, and (rarely) in Venezuela. The rest are confined to white-sand savannas in western Cuba. There all four occur, but the two novelties are thus far known only from a few populations within a very narrow area of far western Pinar del Río.

LITERATURE CITED

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